

CLAIMS

1. A method of retrieving a data item to a mobile device carried by a first user visiting a real-world space, the data item being available from a service system to mobile devices of users visiting the space; the method comprising the steps of:
- (a) seeking to retrieve the data item to the first user's mobile device by transfer from another mobile device in said space;
 - (b) in the event that step (a) is unsuccessful, retrieving the data item to the first user's mobile device by transfer from the service system.
2. A method according to claim 1, wherein the data item is associated with a location in said space, step (a) being initiated as the user approaches or is at that location and including carrying out an enquiry limited to mobile devices that are, or are likely to be, near the first user or said location, to identify a mobile device, if any, holding the data item.
3. A method according to claim 2, wherein said enquiry is limited to mobile devices near the mobile device of the first user by having that device make the enquiry by using a short-range communications means to ask other mobile devices if they have the data item.
4. A method according to claim 2, wherein said enquiry is limited to mobile devices near the mobile device of the first user or near the location associated with the data item, by monitoring the locations of the mobile devices in said space.
5. A method according to claim 2, wherein said enquiry is limited to mobile devices likely to be near the mobile device of the first user by pre-defining a set of mobile devices which are associated with users belonging to the same visit group.
6. A method according to claim 2, wherein in step (a) said enquiry is carried out by the first user's mobile device.
7. A method according to claim 2, wherein in step (a) said enquiry is carried out by the service system at the prompting of the first user's mobile device, the service system

identifying back to the first user's mobile device at least one device holding the data item where the enquiry identifies any such device.

8. A method according to claim 1, further comprising an on-going step of keeping a record of which mobile devices, if any, hold or are likely to be holding the data item; step (a) including carrying out an enquiry limited to mobile devices that, according to said record, hold or are likely to be holding the data item.

9. A method according to claim 8, wherein said on-going step comprises tracking at least the first one of:

- transfers of the data item from the service system to a mobile device;
- transfers of the data item between mobile devices; and
- deletions of the data item from a mobile device.

10. A method according to claim 8, wherein said on-going step comprises at least the first one of:

- periodically making an inventory of items currently held by each mobile device;
- recording incremental changes to the inventory of each mobile devices as items are added / removed.

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11. A method according to claim 8, wherein in step (a) said enquiry is carried out by the first user's mobile device.

12. A method according to claim 8, wherein in step (a) said enquiry is carried out by the service system at the prompting of the first user's mobile device, the service system identifying back to the first user's mobile device at least one device holding the data item where the enquiry identifies any such device.

13. A method according to claim 1, wherein multiple data items each with a respective associated location in said space are available from the service system, the method further comprising an on-going process in which said space is treated as divided into zones and, for each zone, the service system causes the mobile devices in the zone to load data items

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associated with locations in that zone beyond the normal needs of the devices whereby to increase the likelihood of step (a) being successfully effected from a mobile device in the same zone as the first-user's mobile device.

5 14. A method according to claim 1, wherein multiple data items each with a respective associated location in said space are available from the service system, the method further comprising an on-going process in which said space is treated as divided into zones and, for each zone, upon a mobile device exiting the zone, it transfers the data items it holds that have associated locations in the zone being exited to devices, if any, still in said zone
10 whereby to increase the likelihood of step (a) being successfully effected from a mobile device in the same zone as the first-user's mobile device.

15 15. A method according to claim 1, wherein a transfer effected in step (a) is effected using a communications mechanism that is different to that used for a transfer effected in step (b).

16. An arrangement for retrieving a data item to a mobile device carried by a first user visiting a real-world space, the data item being available from a service system to mobile devices of users visiting said space; the arrangement comprising:
20 - first retrieval means for seeking to retrieve the data item to the first user's mobile device by transfer from another mobile device;
- second retrieval means for retrieving the data item to the first user's mobile device by transfer from the service system; and
- control means for organising retrieval of the data item by first causing the first retrieval
25 means to seek to retrieve the data item and then, if this is unsuccessful, causing the second retrieval means to retrieve the data item.

17. An arrangement according to claim 16, wherein the data item is associated with a location in said space, the arrangement including means responsive to the user approaching
30 that location to cause the control means to initiate retrieval of the data item, and the first retrieval means including enquiry means for carrying out an enquiry limited to mobile

devices that are, or are likely to be, near the first user or said location, to identify a mobile device, if any, holding the data item.

18. An arrangement according to claim 17, wherein the first retrieval means includes
5 short-range communication means forming part of said first user's mobile device, the enquiry means being arranged to use said short-range communications means to ask other mobile devices if they have the data item whereby inherently to limit its enquiry to mobile devices near the mobile device of the first user.

10 19. An arrangement according to claim 17, wherein said arrangement includes location means for obtaining the locations of the mobile devices in said space, the enquiry means being arranged to use the device locations obtained by the location means to limit its enquiry to mobile devices near the mobile device of the first user or near the location associated with the data item.

15 20. An arrangement according to claim 17, wherein said arrangement includes set-defining means for pre-defining a set of mobile devices which are associated with users belonging to the same visit group, the enquiry means being arranged to limit its enquiry to mobile devices likely to be near the mobile device of the first user by making its enquiry only to
20 devices which, according to said set-defining means, are members of said set.

21. An arrangement according to claim 17, wherein said enquiry means is part of the first user's mobile device.

25 22. An arrangement according to claim 17, wherein the enquiry means is part of the service system and the first retrieval means further includes means at the first user's mobile device for prompting the enquiry means to carry out its enquiry and identify back to the first user's mobile device at least one device holding the data item where the enquiry identifies any such device.

30 23. An arrangement according to claim 16, wherein said arrangement includes record means for keeping an on-going record of which mobile devices, if any, hold or are likely to

be holding the data item; the first retrieval means including enquiry means for carrying out an enquiry limited to mobile devices that, according to said record, hold or are likely to be holding the data item.

5 **24.** An arrangement according to claim 23, wherein said record means is arranged to track at least the first one of:

- transfers of the data item from the service system to a mobile device;
- transfers of the data item between mobile devices; and
- deletions of the data item from a mobile device.

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25. An arrangement according to claim 23, wherein said record means is arranged to carry out at least the first one of:

- periodically making an inventory of items currently held by each mobile device;
 - recording incremental changes to the inventory of each mobile devices as items are
- 15 added / removed.

26. An arrangement according to claim 23, wherein said enquiry means is part of the first user's mobile device.

20 **27.** An arrangement according to claim 23, wherein the enquiry means is part of the service system and the first retrieval means further includes means at the first user's mobile device for prompting the enquiry means to carry out its enquiry and identify back to the first user's mobile device at least one device holding the data item where the enquiry identifies any such device.

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28. An arrangement according to claim 16, wherein multiple data items each with a respective associated location in said space are available from the service system, the arrangement further comprising location means for monitoring the locations of the mobile devices, and a zone-based manager that is arranged to treat said space as divided into zones

30 and, for each zone, to cause the mobile devices in the zone to load data items associated with locations in that zone beyond the normal needs of the devices whereby to increase the

likelihood of the first retrieval means being successful in seeking to retrieve said data item from a mobile device in the same zone as the first-user's mobile device.

29. An arrangement according to claim 16, wherein multiple data items each with a
5 respective associated location in said space are available from the service system, the
method further comprising an on-going process in which said space is treated as divided
into zones and, for each zone, upon a mobile device exiting the zone, it transfers the data
items it holds that have associated locations in the zone being exited to devices, if any, still
in said zone whereby to increase the likelihood of step (a) being successfully effected from
10 a mobile device in the same zone as the first-user's mobile device.

30. An arrangement according to claim 16, wherein the first and second retrieval means
are arranged to use different respective communication mechanisms for effecting retrieval
of said data item.